

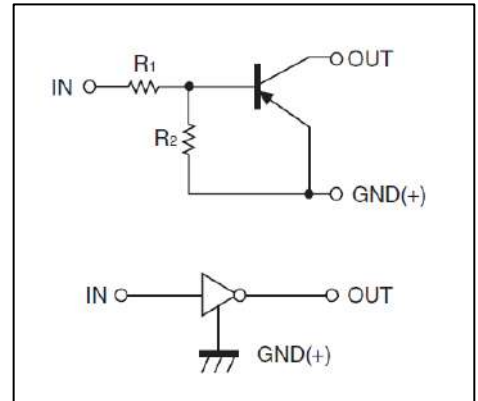
## Digital Transistors (Built-in Resistors)

DIGITAL TRANSISTOR (PNP)

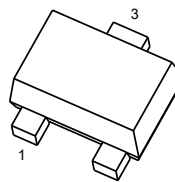
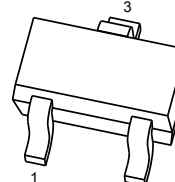
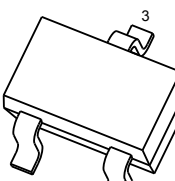
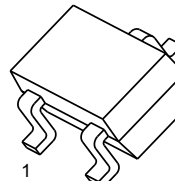
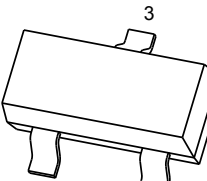
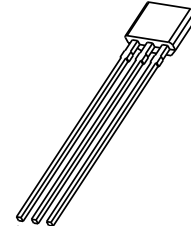
### FEATURES

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
- The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input.They also have the advantage of almost completely eliminating parasitic effects
- Only the on/off conditions need to be set for operation, making device design easy

### • Equivalent Circuit



### PIN CONNENCTIONS and MARKING

<p><b>DTA123JM</b></p>  <p><b>SOT-723</b></p> <p>1. IN 2. GND 3. OUT</p>	<p><b>DTA123JE</b></p>  <p><b>SOT-523</b></p> <p>1. IN 2. GND 3. OUT</p>
<p><b>DTA123JUA</b></p>  <p><b>SOT-323</b></p> <p>1. IN 2. GND 3. OUT</p>	<p><b>DTA123JKA</b></p>  <p><b>SOT-23-3L</b></p> <p>1. IN 2. GND 3. OUT</p>
<p><b>DTA123JCA</b></p>  <p><b>SOT-23</b></p> <p>1. IN 2. GND 3. OUT</p>	<p><b>DTA123JSA</b></p>  <p><b>TO-92S</b></p> <p>1. GND 2. OUT 3. IN</p>

## ORDERING INFORMATION

Part Number	MARKING <sup>(1)</sup>	Package	Packing Method	Pack Quantity
DTA123JM	<b>E32</b>	SOT-723	Reel	8000pcs/Reel
DTA123JE	<b>E32</b>	SOT-523	Reel	3000pcs/Reel
DTA123JUA	<b>132</b>	SOT-323	Reel	3000pcs/Reel
DTA123JKA	<b>E32</b>	SOT-23-3L	Reel	3000pcs/Reel
DTA123JCA	<b>E32</b>	SOT-23	Reel	3000pcs/Reel
DTA123JSA	<b>A123</b> <sup>(2)</sup> <b>J·XXX</b>	TO-92S	Bulk	1000pcs/Bag
DTA123JSA-TA	<b>A123</b> <sup>(2)</sup> <b>J·XXX</b>	TO-92S	Tape	3000pcs/Box

Notes: (1). Solid dot= Green molding compound device, if none, the normal device.

(2). XXX=Code

## MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

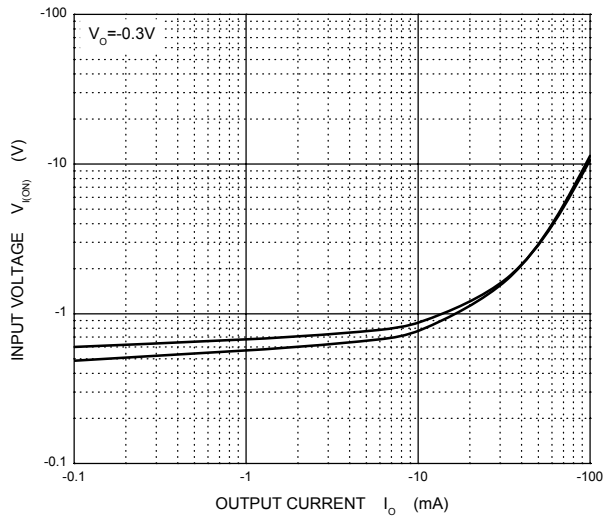
Symbol	Parameter	Limits(DTA123J)						Unit
		M	E	UA	KA	CA	SA	
V <sub>CC</sub>	Supply Voltage	-50						V
V <sub>IN</sub>	Input Voltage	-12~+5						V
I <sub>O</sub>	Output Current	-100						mA
P <sub>D</sub>	Power Dissipation	100	150	200	200	200	300	mW
T <sub>J</sub> , T <sub>stg</sub>	Operation Junction and Storage Temperature Range	-55~+150						°C

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

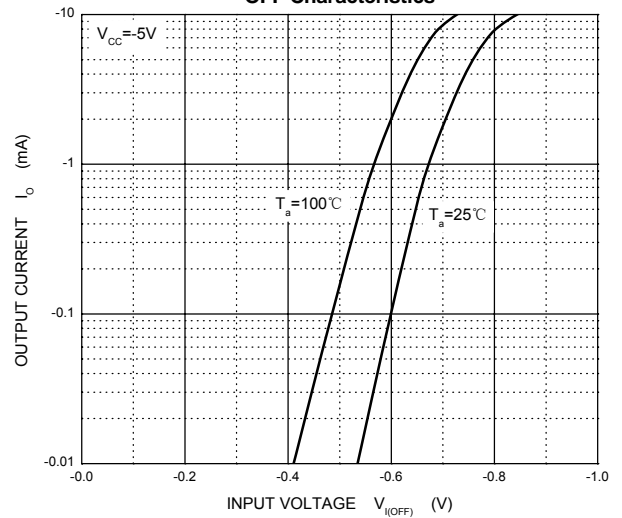
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	V <sub>I(off)</sub>	V <sub>CC</sub> =-5V, I <sub>O</sub> =-100μA	-0.5			V
	V <sub>I(on)</sub>	V <sub>O</sub> =-0.3V, I <sub>O</sub> =-5 mA			-1.1	V
Output voltage	V <sub>O(on)</sub>	I <sub>O</sub> /I <sub>I</sub> =-5mA/-0.25mA		-0.1	-0.3	V
Input current	I <sub>I</sub>	V <sub>I</sub> =-5V			-3.6	mA
Output current	I <sub>O(off)</sub>	V <sub>CC</sub> =-50V, V <sub>I</sub> =0			-0.5	μA
DC current gain	G <sub>I</sub>	V <sub>O</sub> =-5V, I <sub>O</sub> =-10mA	80			
Input resistance	R <sub>1</sub>		1.54	2.2	2.86	kΩ
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>		17	21	26	
Transition frequency	f <sub>T</sub>	V <sub>O</sub> =-10V, I <sub>O</sub> =-5mA, f=100MHz		250		MHz

## Typical Characteristics

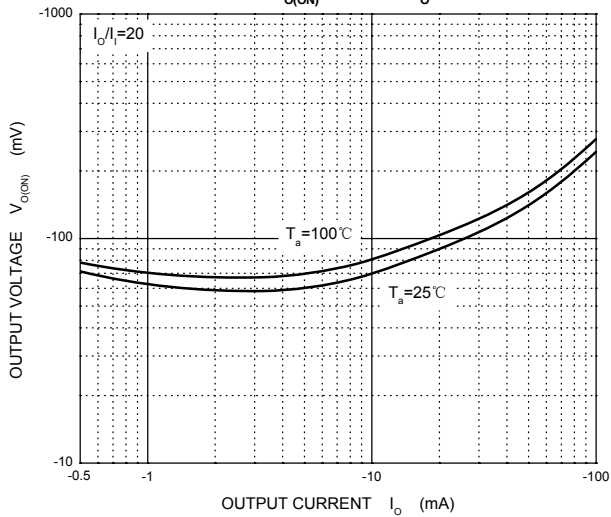
ON Characteristics



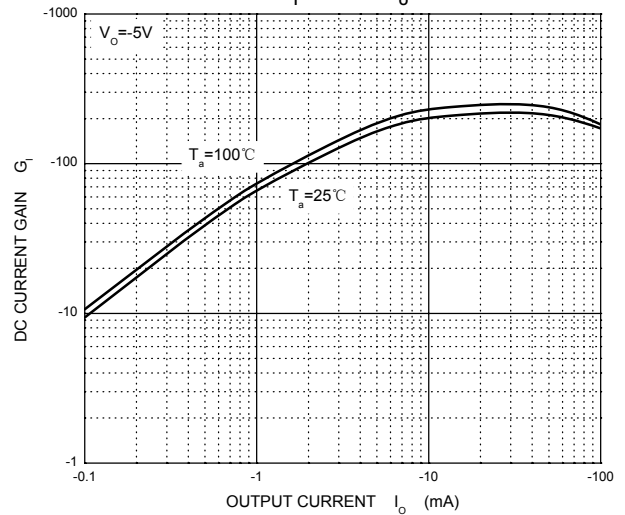
OFF Characteristics



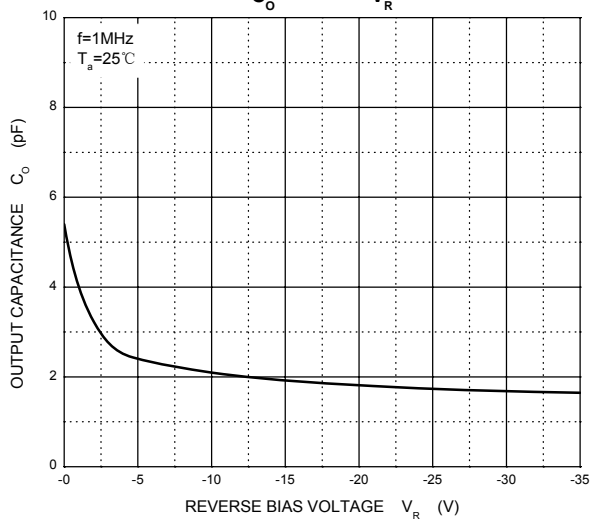
$V_{o(ON)}$  —  $I_o$



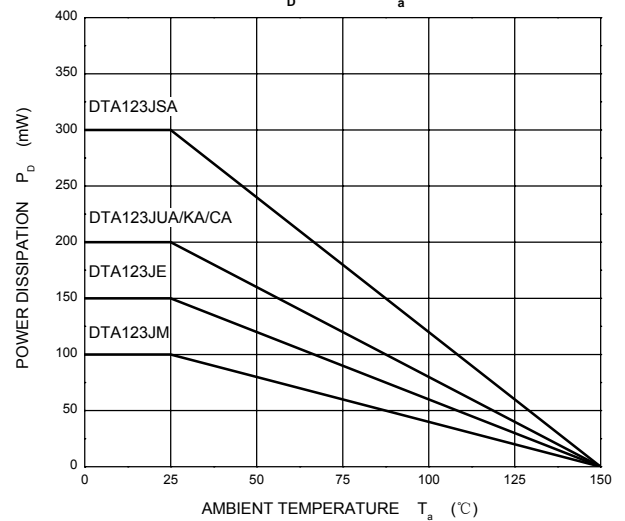
$G_i$  —  $I_o$



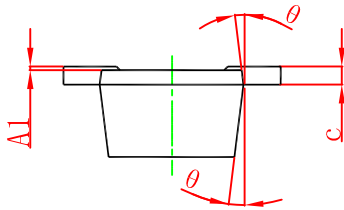
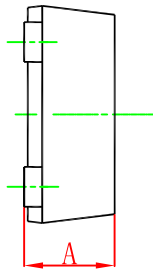
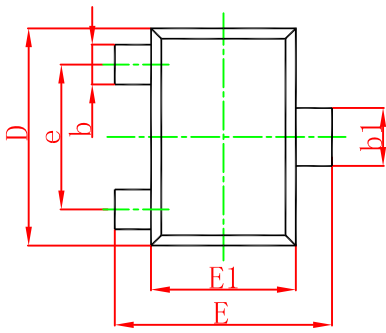
$C_o$  —  $V_R$



$P_D$  —  $T_a$

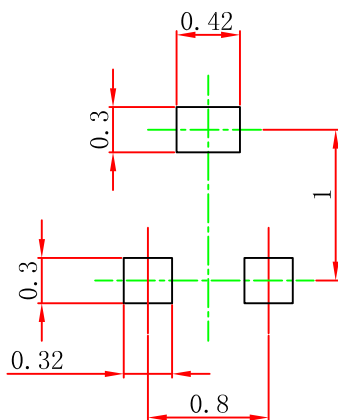


## SOT-723 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

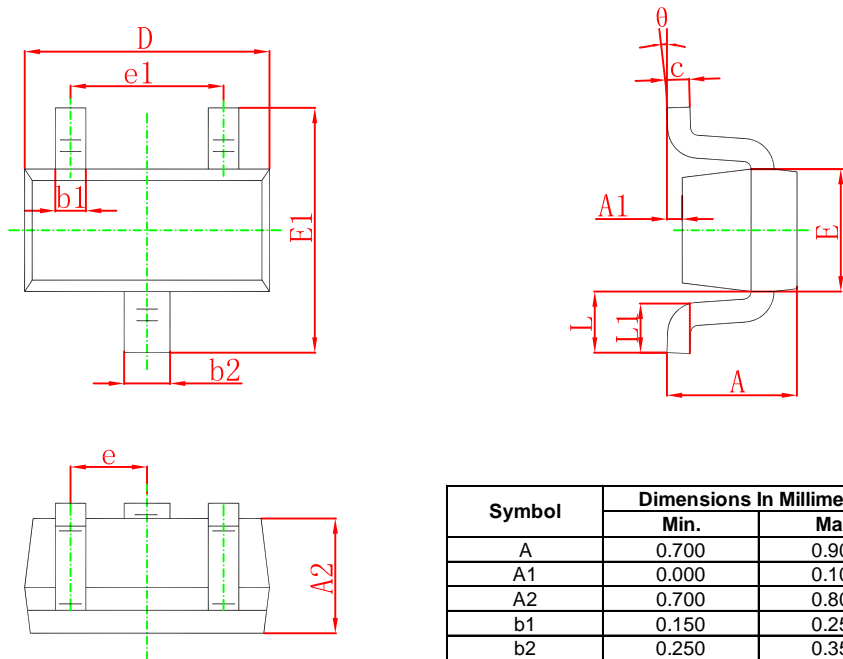
## SOT-723 Suggested Pad Layout



**Note:**

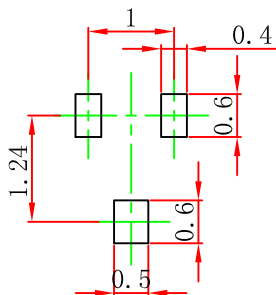
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

## SOT-523 Package Outline Dimensions



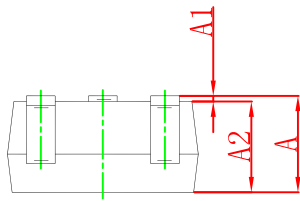
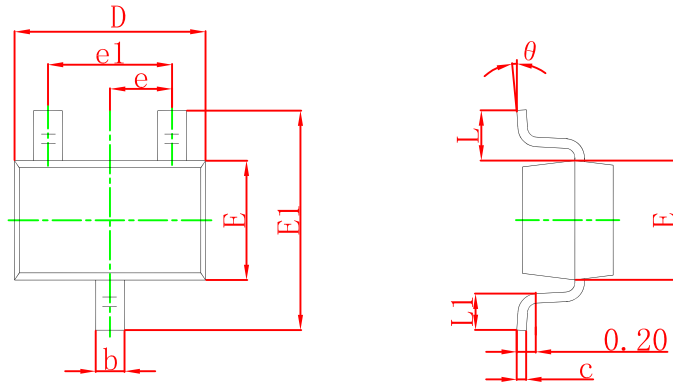
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

## SOT-523 Suggested Pad Layout



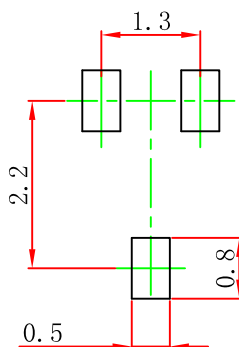
- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.

## SOT-323 Package Outline Dimensions



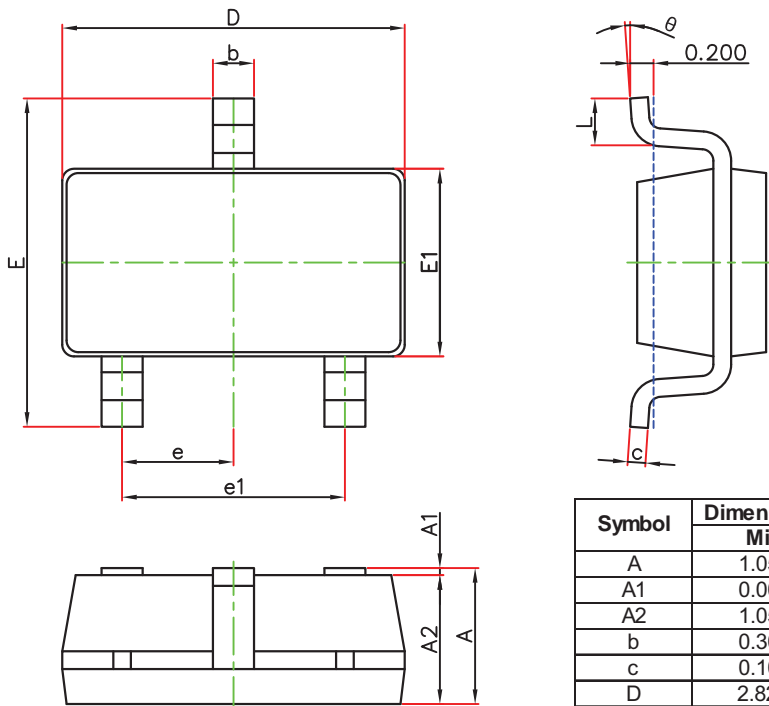
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
$\theta$	0°	8°	0°	8°

## SOT-323 Suggested Pad Layout



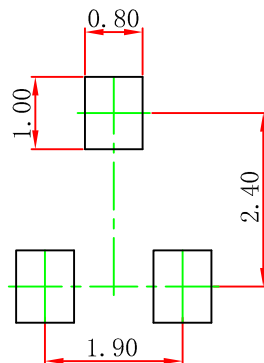
- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05$  mm.
  3. The pad layout is for reference purposes only.

## SOT-23-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°

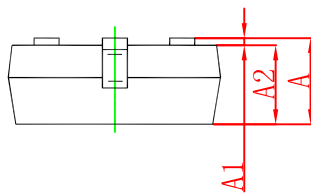
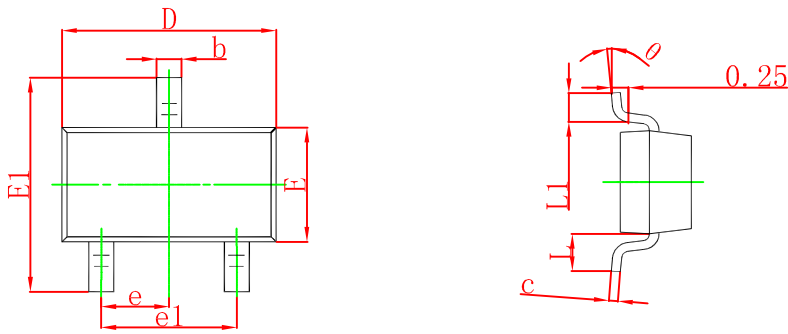
## SOT-23-3L Suggested Pad Layout



**Note:**

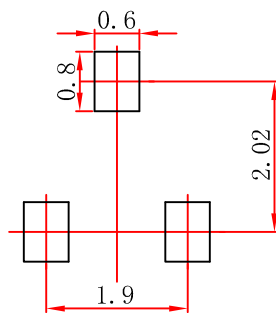
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.

## SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

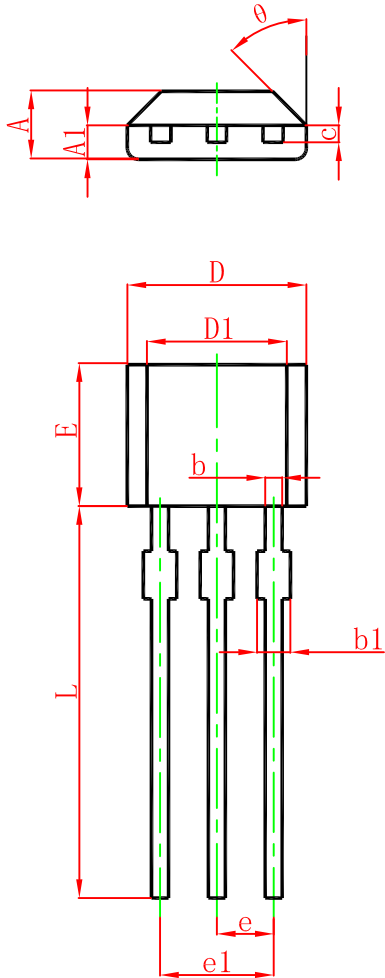
## SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.

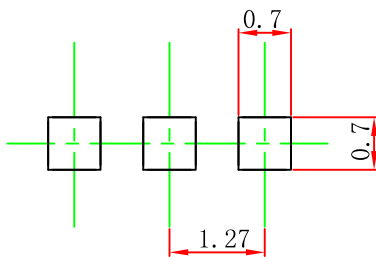


## TO-92S Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.330	0.480	0.013	0.019
b1	0.400	0.510	0.016	0.020
c	0.330	0.510	0.013	0.020
D	3.900	4.100	0.154	0.161
D1	2.280	2.680	0.090	0.106
E	3.050	3.250	0.120	0.128
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	15.100	15.500	0.594	0.610
θ	45° TYP.		45° TYP.	

## TO-92S Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

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